

AMENDMENTS TO THE SPECIFICATION

Please replace the abstract with the new abstract attached hereto as a separate sheet pursuant to 37 CFR § 1.72.

In the specification at page 1, after the title and the paragraph entitled "RELATED APPLICATIONS" added in the Preliminary Amendment dated August 25, 2006, and the paragraph entitled "SUBMISSION ON COMPACT DISC" directing entry of the Sequence Listing submission added in the Amendment dated May 17, 2007, please insert the following heading:

FIELD OF THE INVENTION

In the specification at page 2, line 8, please insert the following heading:

DESCRIPTION OF RELATED ART

In the specification at page 9, line 8, please insert the following paragraphs:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows various synthetic pathways for the biosynthesis of DHA (docosahexaenoic acid).

Figure 2 shows substrate specificity of the 5-elongase (SEQ ID NO: 53) with regard to different fatty acids.

Figure 3 shows reconstitution of DHA biosynthesis in yeast starting from 20:5 ω 3.

Figure 4 shows reconstitution of DHA biosynthesis in yeast starting from 18:4 ω 3.

Figure 5 shows fatty acid composition (in mol%) of transgenic yeasts which had been transformed with the vectors pYes3-OmELO3/pYes2-EgD4 or pYes3-OmELO3/pYes2-EgD4+pESCLeu-PtD5. The yeast cells were cultured in minimal medium without tryptophan and uracil/ and leucin in the presence of 250M 20:5 $\Delta^{5,8,11,14,17}$ and 18:4 $\Delta^{6,9,12,15}$, respectively. The fatty acid methyl esters were obtained from cell sediments by acid methanolysis and analyzed via GLC. Each value represents the mean (n=4) \pm standard deviation.

Figure 6 shows feeding experiment for determining the functionality and substrate specificity with yeast strains.

Figure 7 shows elongation of eicosapentaenoic acid by OtElo1.

Figure 8 shows elongation of arachidonic acid by OtElo1.

Figure 9 shows expression of TpELO1 in yeast.

Figure 10 shows expression of TpELO3 in yeast.

Figure 11 shows expression of *Thraustochytrium* 5-elongase TL16/pYES2.1 in yeast.

Figure 12 shows desaturation of γ -linolenic acid (18:2 ω 6-fatty acid) to give α -linolenic acid (18:3 ω 3-fatty acid) by Pi-omega3Des.

Figure 13 shows desaturation of γ -linolenic acid (18:2 ω 6-fatty acid) to give stearidonic acid (18:4 ω 3-fatty acid) by Pi-omega3Des.

Figure 14 shows desaturation of C20:2 ω 6-fatty acid to give C20:3 ω 3-fatty acid by Pi-omega3Des.

Figure 15 shows desaturation of C20:3 ω 6-fatty acid to give C20:4 ω 3-fatty acid by Pi-omega3Des.

Figure 16 shows desaturation of arachidonic acid (C20:4 ω 6-fatty acid) to give eicosapentaenoic acid (C20:5 ω 3-fatty acid) by Pi-omega3Des.

Figure 17 shows desaturation of docosatetraenoic acid (C22:4 ω 6-fatty acid) to give docosapentaenoic acid (C22:5 ω 3-fatty acid) by Pi-omega3Des.

Figure 18 shows substrate specificity of Pi-omega3Des with regard to different fatty acids.

Figure 19 shows desaturation of phospholipid-bound arachidonic acid to give EPA by Pi-Omega3Des.

Figure 20 shows conversion of linoleic acid (arrow) to give γ -linolenic acid (γ -18:3) by OtDes6.1.

Figure 21 shows conversion of linoleic acid and α -linolenic acid (A and C), and reconstitution of the ARA and EPA synthetic pathways, respectively, in yeast (B and D) in the presence of OtD6.1.

Figure 22 shows expression of ELO(XI) in yeast.

Figure 23 shows substrate specificity of ELO(Ci).

Figure 24 shows elongation of eicosapentaenoic acid by OtElo1 (B) and OtElo1.2 (D), respectively. The controls (A, C) do not show the elongation product (22:5 ω 3).

Figure 25 shows elongation of arachidonic acid by OtElo1 (B) and OtElo1.2 (D), respectively. The controls (A, C) do not show the elongation product (22:4 ω 6).

Figure 26 shows elongation of 20:5n-3 by the elongases At3g06470.

Figure 27 shows substrate specificity of the *Xenopus* Elongase (A), *Ciona* Elongase (B) and *Oncorhynchus* Elongase (C).

Figure 28 shows substrate specificity of the *Ostreococcus* Δ 5-elongase (A), the *Ostreococcus* Δ 6-elongase (B), the *Thalassiosira* Δ 5-elongase (C) and the *Thalassiosira* Δ 6-elongase (D).

Figure 29 shows expression of the *Phaeodactylum tricornutum* Δ 6-elongase (PtELO6) in yeast. A) shows the elongation of the C18:3 $^{\Delta 6,9,12}$ fatty acid and B) the elongation of the C18:3 $^{\Delta 6,9,12,15}$ fatty acid.

Figure 30 shows the substrate specificity of PtELO6 with regard to the substrates fed.

Figure 31 shows gas-chromatographic analysis of the seed of a transgenic plant, transformed with pSUN-5G.

Figure 32 shows gas-chromatographic analysis of the seed of a transgenic plant, transformed with pGPTV-D6Des(Pir)_D5Des(Tc)_D6Elo(PP)_12Des(Co).

Figure 33 shows DHA in transgenic seeds of *Brassica juncea*. The plants were transformed with the construct pSUN-8G.

DETAILED DESCRIPTION OF THE INVENTION